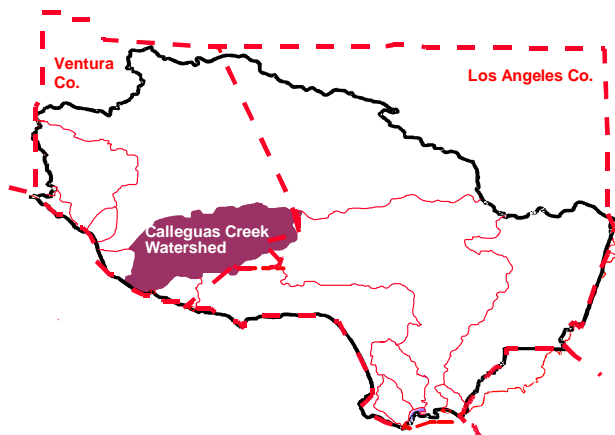


CALLEGUAS CREEK WATERSHED

This was a targeted watershed for permitting purposes in FY95/96 and FY01/02.

Overview of Watershed



Calleguas Creek and its major tributaries, Revolon Slough, Conejo Creek, Arroyo Conejo, Arroyo Santa Rosa, and Arroyo Simi drain an area of 343 square miles in southern Ventura County and a small portion of western Los Angeles County. This watershed, which is elongated along an east-west axis, is about 30 miles long and 14 miles wide. The northern boundary of the watershed is formed by the Santa Susana Mountains, South Mountain, and Oak Ridge; the southern boundary is formed by the Simi Hills and

Santa Monica Mountains.

Land uses vary throughout the watershed. Urban developments are generally restricted to the city limits of Simi Valley, Moorpark, Thousand Oaks, and Camarillo. Although some residential development has occurred along the slopes of the watershed, most upland areas are still open space, however, golf courses are becoming increasingly popular to locate in these open areas. Agricultural activities, primarily cultivation of orchards and row crops, are spread out along valleys and on the Oxnard Plain.

Mugu Lagoon, located at the mouth of the watershed, is one of the few remaining significant saltwater wetland habitats in southern California. The Point Mugu Naval Air Base is located in the immediate area and the surrounding Oxnard Plain supports a large variety of agricultural crops. These fields drain into ditches which either enter the lagoon directly or through Calleguas Creek and its tributaries. Other fields drain into tile drain systems which discharge to drains or creeks. Also in the area of the base are freshwater wetlands created on a seasonal basis to support duck hunting clubs. The lagoon borders on an Area of Special Biological Significance (ASBS) and supports a great diversity of wildlife including several endangered birds and one endangered plant species. Except for the military base, the lagoon area is relatively undeveloped.

Beneficial Uses in watershed:

<u>Estuary</u>	<u>Above Estuary</u>
Wildlife habitat	Wildlife habitat
Contact & noncontact water recreation	Contact & noncontact water recreation
Estuarine habitat	Industrial service supply
Marine habitat	Industrial process supply
Preservation of rare & endangered species	Preservation of rare & endangered species
Navigation	Agricultural supply
Preservation of biological habitats	Groundwater recharge
Wetlands habitat	Wetlands habitat
Migratory & spawning habitat	Freshwater replenishment
Shellfish harvesting	Warmwater habitat

Supplies of ground water are critical to agricultural operations and industry (sand and gravel mining) in this watershed. Moreover, much of the population in the watershed relies upon ground water for drinking.

Water Quality Problems and Issues

Aquatic life in both Mugu Lagoon and the inland streams of this watershed has been impacted by pollutants from nonpoint sources. DDT, PCBs, other pesticides, and some metals have been detected in both sediment and biota collected from surface waterbodies of this watershed.

Additionally, ambient toxicity has been revealed in several studies from periodic toxicity testing in the watershed (ammonia from POTWs and pesticides such as diazinon and chlorpyrifos are implicated). Fish collected from Calleguas Creek and Revolon Slough exhibit skin lesions and have been found to have other histopathologic abnormalities. High levels of minerals and nitrates are common in the water column as well as in the groundwater. Sediment toxicity is also elevated in some parts of the lagoon.

Reproduction is impaired in the resident endangered species, the light-footed clapper rail due to elevated levels of DDT and PCBs.

Overall, this is a very impaired watershed. It appears that the sources of many of these pollutants are agricultural activities (mostly through continued disturbance and erosion of historically contaminated soils), which cover approximately 25% of the watershed along the inland valleys and coastal plain, although the nearby naval facility has also been a contributor. Other nonpoint sources include residential and urban activities, which are present over approximately 25% of the watershed. The remaining 50% of the watershed is still open space although there is a severe lack of benthic and riparian habitat.

Permitted discharges:

- 22 NPDES discharges; three major discharges (POTWs); nine minor discharges (3 POTWs); ten discharges covered by general permits
- 55 dischargers covered under an industrial storm water permit
- 151 dischargers covered under construction storm water permit
- Municipal storm water permit

Mugu Lagoon as well as the Calleguas Creek Estuary is considered a toxic hot spot under the Bay Protection and Toxic Cleanup Program (BPTCP) due to reproductive impairment (the endangered clapper rail), exceedance of the state Office of Environmental and Health Hazard Assessment (OEHHA) advisory level for mercury in fish, and exceedance of the NAS guideline level for DDT in fish, sediment concentrations of DDT, PCB, chlordane, chlorpyrifos, sediment toxicity and degraded benthic infaunal community.

Primary issues related to POTW discharges include ammonia toxicity and high mineral content (i.e., salinity), the latter, in part, due to imported water supplies.

Types of permitted wastes discharged into the Calleguas Creek Watershed:

Nature of Waste <i>Prior</i> to Treatment or Disposal	# of Permits	Types of Permits
Nonhazardous (designated) contaminated groundwater	1 1	Minor General
Nonhazardous (designated) wastes from dewatering, rec. lake overflow, swimming pool wastes, water ride wastewater, or groundwater seepage	2 4	Minor General
Hazardous contaminated groundwater	3 3	Minor General
Nonhazardous (designated) domestic sewage & industrial waste	3 2	Major Minor
Nonhazardous wastes from dewatering, rec. lake overflow, swimming pool wastes, water ride wastewater, or groundwater seepage	1	General
Inert wastes from dewatering, rec. lake overflow, swimming pool wastes, water ride wastewater, or groundwater seepage	1	General

Hazardous wastes are those influent or solid wastes that contain toxic, corrosive, ignitable, or reactive substances (prior to treatment or disposal) managed according to applicable Department of Health Services standards

Designated wastes are those influent or solid wastes that contain **nonhazardous** wastes (prior to treatment or disposal) that pose a significant threat to water quality because of their high concentrations

Nonhazardous wastes are those influent or solid wastes that do not contain soluble pollutants or organic wastes (prior to treatment or disposal) and have little adverse impact on water quality

Inert wastes are those influent or solid wastes that do not contain soluble pollutants or organic wastes (prior to treatment or disposal) and have little adverse impact on water quality

Major discharges are POTWs with a yearly average flow of over 0.5 MGD or an industrial source with a yearly average flow of over 0.1 MGD and those with lesser flows but with acute or potential adverse environmental impacts.

Minor discharges are all other discharges that are not categorized as a Major. Minor discharges may be covered by a general permit, which are issued administratively, for those that meet the conditions specified by the particular general permit.

Discharges are fairly evenly spread around the watershed; eight of the 22 NPDES discharges go to the Arroyo Conejo, while four each discharge to the Arroyo Simi, Arroyo Las Posas, and Calleguas Creek.

Of the 55 dischargers enrolled under the general industrial storm water permit in the watershed, the largest numbers are located in the cities of Simi Valley and Camarillo. Auto wrecking and sand and gravel operations represent a large number of these facilities. Forty-nine facilities are on larger than one acre sites and twenty are on sites of larger than ten acres.

There are 151 construction sites enrolled under the construction storm water permit. Most of the sites are located in Camarillo, Simi Valley, Thousand Oaks, and Moorpark. The majority of these are sites 10 acres or larger in size.

The table below gives examples of typical data ranges which led to the 1998 303(d) listings.

IMPAIRMENTS:

Impairments	Applicable Objective/Criteria	Typical Data Ranges Resulting in Impairment	303(d) Listed Waters/Reaches
nitrate + nitrite	Basin Plan numeric objective: no greater than 10 mg/l	11.9 - 70.0 mg/l (mean of 48.5 ± 13)	Fox Barranca Arroyo Las Posas Reach 1 (Lewis/Somis Rd. to Fox Barranca) Arroyo Las Posas Reach 2 (Fox Barranca to Moorpark Fwy (23)) Arroyo Simi Reach 1 (Moorpark Fwy (23) to Brea Cyn) Calleguas Creek Reach 3 (Potrero to Somis Rd.)
nitrogen	Basin Plan numeric objective: no greater than 10 mg/l		Rio de Santa Clara/Oxnard Drain #3 Calleguas Creek Reach 1 (estuary to 0.5 mi. S. of Broome Rd.) Calleguas Creek Reach 2(0.5 mi. S. of Broome Rd. to Potrero Rd.) Revolon Slough Main Branch (Mugu Lagoon to Central Ave.) Beardsley Channel (above Central Ave.) Mugu Lagoon Duck pond agric. drain/Mugu Drain/Oxnard Drain #2
ammonia	Basin Plan narrative objective Basin Plan numeric objective: varies depending on pH and temperature but the general range is 0.53 - 2.7 mg/l of total ammonia (at average pH and temp.) in waters designated as WARM to protect against chronic toxicity and 2.3 - 28.0 mg/l to protect against acute toxicity	0.1 - 20.2 mg/l (mean of 2.7 ± 3.6)	Arroyo Las Posas Reach 1 (Lewis/Somis Rd. to Fox Barranca) Arroyo Las Posas Reach 2 (Fox Barranca to Moorpark Fwy (23)) Arroyo Simi Reach 1 (Moorpark Fwy (23) to Brea Cyn) Calleguas Creek Reach 1 (estuary to 0.5 mi. S. of Broome Rd.) Calleguas Creek Reach 2(0.5 mi. S. of Broome Rd. to Potrero Rd.) Conejo Creek/Arroyo Conejo N. Fork Conejo Creek Reach 1 (confl. Calleguas to Santa Rosa Rd) Conejo Creek Reach 2 (Santa Rosa Rd. to Tho. Oaks city limit) Conejo Creek Reach 3 (Tho. Oaks city limit to Lynn Rd.) Conejo Creek Reach 4 (above Lynn Rd.)
algae	Basin Plan narrative objective		Conejo Creek Reach 1 (confl. Calleguas to Santa Rosa Rd) Conejo Creek Reach 2 (Santa Rosa Rd. to Tho. Oaks city limit) Conejo Creek Reach 3 (Tho. Oaks city limit to Lynn Rd.) Conejo Creek Reach 4 (above Lynn Rd.) Revolon Slough Main Branch (Mugu Lagoon to Central Ave.) Beardsley Channel (above Central Ave.)
low DO/org. enrichment	Basin Plan narrative objective Basin Plan numeric objective: annual mean greater than 7.0 mg/l no single sample less than 5.0 mg/l	2.6 - 10.9 mg/l (mean of 7.0 ± 1.8)	Conejo Creek Reach 1 (confl. Calleguas to Santa Rosa Rd) Conejo Creek Reach 2 (Santa Rosa Rd. to Tho. Oaks city limit) Conejo Creek Reach 3 (Tho. Oaks city limit to Lynn Rd.) Conejo Creek Reach 4 (above Lynn Rd.)
chlorpyrifos (tissue)	Basin Plan narrative objective		Revolon Slough Main Branch (Mugu Lagoon to Central Ave.) Beardsley Channel (above Central Ave.)
toxicity	Basin Plan narrative objective	0 - 100 % survival	Conejo Creek Reach 1 (confl. Calleguas to Santa Rosa Rd) Conejo Creek Reach 2 (Santa Rosa Rd. to Tho. Oaks city limit) Conejo Creek Reach 3 (Tho. Oaks city limit to Lynn Rd.) Conejo Creek Reach 4 (above Lynn Rd.) Calleguas Creek Reach 1 (estuary to 0.5 mi. S. of Broome Rd.) Calleguas Creek Reach 2(0.5 mi. S. of Broome Rd. to Potrero Rd.) Duck pond agric. drain/Mugu Drain/Oxnard Drain #2 Revolon Slough Main Branch (Mugu Lagoon to Central Ave.) Beardsley Channel (above Central Ave.)

Impairments	Applicable Objective/Criteria	Typical Data Ranges Resulting in Impairment	303(d) Listed Waters/Reaches
chloride	Basin Plan numeric objective: 150 mg/l	78 - 230 mg/l (mean of 173 ± 31)	Tapo Canyon Reach 1 Arroyo Simi Reach 1 (Moorpark Fwy (23) to Brea Cyn) Arroyo Las Posas Reach 2 (Fox Barranca to Moorpark Fwy (23)) Arroyo Las Posas Reach 1 (Lewis/Somis Rd. to Fox Barranca) Calleguas Creek Reach 3 (Potrero to Somis Rd.) Conejo Creek Reach 2 (Santa Rosa Rd. to Tho. Oaks city limit) Conejo Creek Reach 4 (above Lynn Rd.)
Boron	Basin Plan numeric objective: 1.0 mg/l	0.4 - 1.4 mg/l (mean of 1.1 ± 0.3)	Fox Barranca Tapo Canyon Reach 1 Arroyo Simi Reach 1 (Moorpark Fwy (23) to Brea Cyn) Arroyo Simi Reach 2 (above Brea Canyon) Calleguas Creek Reach 3 (Potrero to Somis Rd.)
sulfate	Basin Plan numeric objective: 250 mg/l	185 - 1000 mg/l (mean of 642 ± 278)	Fox Barranca Tapo Canyon Reach 1 Arroyo Simi Reach 1 (Moorpark Fwy (23) to Brea Cyn) Arroyo Simi Reach 2 (above Brea Canyon) Arroyo Las Posas Reach 1 (Lewis/Somis Rd. to Fox Barranca) Arroyo Las Posas Reach 2 (Fox Barranca to Moorpark Fwy (23)) Conejo Creek/Arroyo Conejo N. Fork Conejo Creek Reach 1 (confl. Calleguas to Santa Rosa Rd) Conejo Creek Reach 2 (Santa Rosa Rd. to Tho. Oaks city limit) Conejo Creek Reach 3 (Tho. Oaks city limit to Lynn Rd.) Conejo Creek Reach 4 (above Lynn Rd.)
total dissolved solids	Basin Plan numeric objective 850 mg/l	460 - 1470 mg/l (mean of 1023 ± 246)	Tapo Canyon Reach 1 Fox Barranca Arroyo Simi Reach 1 (Moorpark Fwy (23) to Brea Cyn) Arroyo Simi Reach 2 (above Brea Canyon) Arroyo Las Posas Reach 1 (Lewis/Somis Rd. to Fox Barranca) Arroyo Las Posas Reach 2 (Fox Barranca to Moorpark Fwy (23)) Calleguas Creek Reach 3 (Potrero to Somis Rd.) Conejo Creek/Arroyo Conejo N. Fork Conejo Creek Reach 1 (confl. Calleguas to Santa Rosa Rd) Conejo Creek Reach 2 (Santa Rosa Rd. to Tho. Oaks city limit) Conejo Creek Reach 3 (Tho. Oaks city limit to Lynn Rd.) Conejo Creek Reach 4 (above Lynn Rd.)
DDT (tissue & sediment)	Basin Plan narrative objective	37.5 - 1648.0 ng/g (sediment)	Arroyo Las Posas Reach 1 (Lewis/Somis Rd. to Fox Barranca) Arroyo Las Posas Reach 2 (Fox Barranca to Moorpark Fwy (23)) Conejo Creek/Arroyo Conejo N. Fork
	State Board numeric objective (tissue): Max. Tissue Residue Level 32.0 ng/g	145.9 - 556.9 ng/g (tissue)	Conejo Creek Reach 1 (confl. Calleguas to Santa Rosa Rd) Conejo Creek Reach 2 (Santa Rosa Rd. to Tho. Oaks city limit) Conejo Creek Reach 3 (Tho. Oaks city limit to Lynn Rd.) Conejo Creek Reach 4 (above Lynn Rd.) Calleguas Creek Reach 1 (estuary to 0.5 mi. S of Broome Rd.) Calleguas Creek Reach 2 (0.5 mi. S of Broome Rd. to Potrero Rd.) Duck pond agric. drain/Mugu Drain/Oxnard Drain #2 Revolon Slough Main Branch (Mugu Lagoon to Central Ave.) Beardsley Channel (above Central Ave.) Mugu Lagoon Rio de Santa Clara/Oxnard Drain #3
chlordanes (tissue & sediment)	Basin Plan narrative objective	3.4 - 45.0 ng/g (sediment)	Conejo Creek/Arroyo Conejo N. Fork Calleguas Creek Reach 1 (estuary to 0.5 mi. S of Broome Rd.) Calleguas Creek Reach 2 (0.5 mi. S of Broome Rd. to Potrero Rd.)
	State Board numeric objective (tissue): Max. Tissue Residue Level 1.1 ng/g	28.5 - 40.6 ng/g (tissue)	Duck pond agric. drain/Mugu Drain/Oxnard Drain #2 Revolon Slough Main Branch (Mugu Lagoon to Central Ave.) Beardsley Channel (above Central Ave.) Mugu Lagoon Rio de Santa Clara/Oxnard Drain #3

Impairments	Applicable Objective/Criteria	Typical Data Ranges Resulting in Impairment	303(d) Listed Waters/Reaches
ChemA* (tissue)	National Academy of Science Guideline (tissue): 100 ng/g	695.9 - 1910.1 ng/g (tissue)	Conejo Creek Reach 1 (confl. Calleguas to Santa Rosa Rd) Conejo Creek Reach 2 (Santa Rosa Rd. to Tho. Oaks city limit) Conejo Creek Reach 3 (Tho. Oaks city limit to Lynn Rd.) Conejo Creek Reach 4 (above Lynn Rd.) Calleguas Creek Reach 1 (estuary to 0.5 mi. S of Broome Rd.) Calleguas Creek Reach 2 (0.5 mi. S of Broome Rd. to Potrero Rd.) Duck pond agric. drain/Mugu Drain/Oxnard Drain #2 Revolon Slough Main Branch (Mugu Lagoon to Central Ave.) Beardsley Channel (above Central Ave.) Rio de Santa Clara/Oxnard Drain #3
dacthal (tissue & sediment)	Basin Plan narrative objective	ND - 120.1 ng/g (sediment) 1.8 - 5.7 ng/g (tissue)	Conejo Creek Reach 1 (confl. Calleguas to Santa Rosa Rd) Conejo Creek Reach 2 (Santa Rosa Rd. to Tho. Oaks city limit) Conejo Creek Reach 3 (Tho. Oaks city limit to Lynn Rd.) Conejo Creek Reach 4 (above Lynn Rd.) Calleguas Creek Reach 2 (0.5 mi. S of Broome Rd. to Potrero Rd.) Revolon Slough Main Branch (Mugu Lagoon to Central Ave.) Beardsley Channel (above Central Ave.) Mugu Lagoon
endosulfan (tissue & sediment)	Basin Plan narrative objective State Board numeric objective (tissue): Max. Tissue Residue Level 250 ng/g	ND - 144.2 ng/g (sediment) 42.3 - 294.0 ng/g (tissue)	Conejo Creek Reach 1 (confl. Calleguas to Santa Rosa Rd) Conejo Creek Reach 2 (Santa Rosa Rd. to Tho. Oaks city limit) Conejo Creek Reach 3 (Tho. Oaks city limit to Lynn Rd.) Conejo Creek Reach 4 (above Lynn Rd.) Calleguas Creek Reach 1 (estuary to 0.5 mi. S of Broome Rd.) Calleguas Creek Reach 2 (0.5 mi. S of Broome Rd. to Potrero Rd.) Revolon Slough Main Branch (Mugu Lagoon to Central Ave.) Beardsley Channel (above Central Ave.) Mugu Lagoon
toxaphene (tissue & sediment)	Basin Plan narrative objective State Board numeric objective (tissue): Max. Tissue Residue Level 8.8 ng/g	ND - 1900 ng/g (sediment) 238 - 468 ng/g (tissue)	Conejo Creek Reach 1 (confl. Calleguas to Santa Rosa Rd) Conejo Creek Reach 2 (Santa Rosa Rd. to Tho. Oaks city limit) Conejo Creek Reach 3 (Tho. Oaks city limit to Lynn Rd.) Conejo Creek Reach 4 (above Lynn Rd.) Calleguas Creek Reach 1 (estuary to 0.5 mi. S of Broome Rd.) Calleguas Creek Reach 2 (0.5 mi. S of Broome Rd. to Potrero Rd.) Duck pond agric. drain/Mugu Drain/Oxnard Drain #2 Revolon Slough Main Branch (Mugu Lagoon to Central Ave.) Beardsley Channel (above Central Ave.) Mugu Lagoon Rio de Santa Clara/Oxnard Drain #3
dieldrin (tissue)	State Board numeric objective (tissue): Max. Tissue Residue Level 0.65 ng/g	4.7 - 6.6 ng/g (tissue)	Revolon Slough Main Branch (Mugu Lagoon to Central Ave.) Beardsley Channel (above Central Ave.)
sediment toxicity	Basin Plan narrative objective	14 - 71 % survival	Calleguas Creek Reach 1 (estuary to 0.5 mi. S. of Broome Rd.) Calleguas Creek Reach 2 (0.5 mi. S. of Broome Rd. to Potrero Rd.) Mugu Lagoon Rio de Santa Clara/Oxnard Drain #3 Duck pond agric. drain/Mugu Drain/Oxnard Drain #2
siltation	Basin Plan narrative objective		Mugu Lagoon
chromium (tissue)	Basin Plan narrative objective	0.51 - 0.58 ug/g (tissue)	Arroyo Simi Reach 1 (Moorpark Fwy (23) to Brea Cyn) Conejo Creek Reach 3 (Tho. Oaks city limit to Lynn Rd.) Conejo Creek Reach 2 (Santa Rosa Rd. to Tho. Oaks city limit) Conejo Creek Reach 1 (confl. Calleguas to Santa Rosa Rd)

* ChemA refers to the sum of the chemicals aldrin, dieldrin, chlordane, endrin, heptachlor, heptachlor epoxide, HCH (including lindane), endosulfan, and toxaphene

Impairments	Applicable Objective/Criteria	Typical Data Ranges Resulting in Impairment	303(d) Listed Waters/Reaches
silver (tissue)	Basin Plan narrative objective	0.03 - 0.04 ug/g (tissue)	Arroyo Simi Reach 1 (Moorpark Fwy (23) to Brea Cyn) Conejo Creek Reach 3 (Tho. Oaks city limit to Lynn Rd.) Conejo Creek Reach 2 (Santa Rosa Rd. to Tho. Oaks city limit) Conejo Creek Reach 1 (confl. Calleguas to Santa Rosa Rd)
nickel (tissue)	Basin Plan narrative objective	0.5 ug/g (tissue)	Arroyo Simi Reach 1 (Moorpark Fwy (23) to Brea Cyn) Conejo Creek Reach 3 (Tho. Oaks city limit to Lynn Rd.) Conejo Creek Reach 2 (Santa Rosa Rd. to Tho. Oaks city limit) Conejo Creek Reach 1 (confl. Calleguas to Santa Rosa Rd) Mugu Lagoon
cadmium (tissue)	Basin Plan narrative objective	0.14 - 0.15 ug/g (tissue)	Conejo Creek Reach 3 (Tho. Oaks city limit to Lynn Rd.) Conejo Creek Reach 2 (Santa Rosa Rd. to Tho. Oaks city limit) Conejo Creek Reach 1 (confl. Calleguas to Santa Rosa Rd)
copper	USEPA water quality criteria: 2.9 ug/l		Mugu Lagoon
zinc	USEPA water quality criteria: 86 ug/l		Arroyo Simi Reach 1 (Moorpark Fwy (23) to Brea Cyn) Mugu Lagoon
Mercury	USEPA water quality criteria: 2.1 ug/l		Mugu Lagoon
Selenium	USEPA water quality criteria: 5.0 ug/l	11.0 ug/l (maximum)	Arroyo Simi Reach 1 (Moorpark Fwy (23) to Brea Cyn) Revolon Slough Main Branch (Mugu Lagoon to Central Ave.)
PCBs (tissue & Sediment)	Basin Plan narrative objective State Board numeric objective (tissue): Max. Tissue Residue Level 2.2 ng/g	ND - 96.0 ng/g (sediment) 16.8 - 70.8 ng/g (tissue)	Calleguas Creek Reach 1 (estuary to 0.5 mi. S of Broome Rd.) Calleguas Creek Reach 2 (0.5 mi. S of Broome Rd. to Potrero Rd.) Revolon Slough Main Branch (Mugu Lagoon to Central Ave.) Beardsley Channel (above Central Ave.) Mugu Lagoon Rio de Santa Clara/Oxnard Drain #3
Trash	Basin Plan narrative objective		Revolon Slough Main Branch (Mugu Lagoon to Central Ave.) Beardsley Channel (above Central Ave.)

CURRENTLY SCHEDULED TMDLS:

Type of TMDL	Listed Waters/Reaches in TMDL	Year Scheduled for Completion (FY)
chloride	Tapo Canyon Reach 1 Arroyo Simi Reach 1 Arroyo Las Posas Reaches 1 and 2 Calleguas Creek Reach 3 Conejo Creek Reaches 2 and 4	01/02
nitrogen	Fox Barranca Arroyo Las Posas Reaches 1 and 2 Arroyo Simi Reach 1 Calleguas Creek Reaches 1, 2 and 3 Conejo Creek/Arroyo Conejo N. Fork Conejo Creek Reaches 1, 2, 3, and 4 Revolon Slough Main Branch Beardsley Channel Mugu Lagoon Duck pond agric. drain/Mugu Drain/Oxnard Drain #2	01/02
pesticides (water-soluble)	Conejo Creek Reaches 1, 2, 3 and 4 Calleguas Creek Reaches 1 and 2 Duck pond agric. drain/Mugu Drain/Oxnard Drain #2 Revolon Slough Main Branch Beardsley Channel	03/04
Other salts	Fox Barranca Tapo Canyon Reach 1 Arroyo Simi Reaches 1 and 2 Arroyo Las Posas Reaches 1 and 2 Calleguas Creek Reach 3 Conejo Creek/Arroyo Conejo N Fork Conejo Creek Reaches 1, 2, 3 and 4	03/04

Type of TMDL	Listed Waters/Reaches in TMDL	Year Scheduled for Completion (FY)
PCBs	Calleguas Creek Reach 1 Calleguas Creek Reach 2 Revolon Slough Main Branch Beardsley Channel Mugu Lagoon	04/05
pesticides (sediment-bound)	Mugu Lagoon Arroyo Las Posas Reaches 1 and 2 Conejo Creek/Arroyo Conejo N. Fork Conejo Creek Reaches 1, 2, 3 and 4 Calleguas Creek Reaches 1 and 2 Duck pond agric. drain/Mugu Drain/Oxnard Drain #2 Revolon Slough Main Branch Beardsley Channel	04/05
metals	Arroyo Simi Reach 1 Conejo Creek Reaches 1, 2 and 3	05/06

We see a need for an additional 2.5 PYs as well as \$50,000 in contract dollars for FY02/03 TMDL work conducted in this watershed.

Stakeholder Groups

Calleguas Creek Watershed Management Committee and Technical Subcommittees:

Recognizing that many of the water quality problems in the lagoon stem from land use practices and pollutant sources above the lagoon, members of these committees meet regularly to exchange data and discuss coordinated approaches to solving the many problems in this watershed, including development of a watershed management plan. The watershed group consists of about 130 stakeholders who have been meeting since November 1996 with the purpose of developing a watershed management plan. As we expect that much effort will need to be focussed on resolving agricultural and flood control issues, a concerted effort to include appropriate stakeholders. Besides the main management committee of stakeholders, five technical subcommittees deal with more specific issues such as water quality, flood protection/ sediment management, habitat/open space/recreation, public outreach, and land use. A Steering Committee attends to the details of management plan development. The full Management Plan Committee meets on a quarterly basis, generally conducting business in a half-day session. Staff have been and will continue to work with these committees. For further information concerning this group, please visit their website at <http://www.calleguas.com/cc.htm>.

A number of the above committee members were also on the *Mugu Lagoon Task Force* which was formed in 1990 in response to concerns about sedimentation filling in Mugu Lagoon which is at the mouth of the Calleguas Creek Watershed. A major focus of the early meetings was exchange of information on the extent of sedimentation with related concerns such as pesticide transfer. A sediment and erosion control plan was prepared for the Ventura County RCD by the U.S. Natural Resource Conservation Service (USNRCS) using Coastal Conservancy funds ("Calleguas Creek Watershed Erosion and Sediment Control Plan for Mugu Lagoon", May 1995). This group is not currently meeting; however, information gained from this effort continues to be used by the other Calleguas Watershed Committees.

Significant Past Activities

CORE REGULATORY

The majority of Calleguas Creek Watershed permits were revised in June 1996. This watershed, as well as the Ventura River Watershed, were pilot watersheds in our implementation of the watershed management approach. The Ventura County Municipal Stormwater NPDES Permit had most recently been adopted in 2000. The watershed was targeted again for NPDES permit renewals in FY01/02.

MONITORING AND ASSESSMENT

The Calleguas Creek Watershed was included in a partial update of the Water Quality Assessment report in 1998. Also, in 2000, the dischargers completed a short-term watershed characterization study which assessed a large number of sites for both biological and chemical parameters.

BASIN PLANNING

In 1990, the Regional Board adopted Resolution No. 90-004 (**Drought Policy**) which had a term of three years and provided interim relief to dischargers who experienced difficulty meeting chloride objectives because of a state-wide drought. The policy adjusted effluent limits to the lesser of 1) 250 mg/l or 2) the chloride concentration in the water supply plus 85 mg/l. In 1995, the Regional Board extended the interim limits for three years and directed staff to develop a long-term solution to deal with the impact of changing water supply, especially during droughts. In 1997, the Regional Board adopted Resolution No. 97-002 (**Chloride Policy**) which set the chloride objective at 190 mg/l except in the Calleguas Creek and Santa Clara River Watersheds where, due to the great concern for protection of agriculture, staff were directed to determine the chloride concentrations sufficient to protect agricultural beneficial uses.

NONPOINT SOURCE PROGRAM

Work on nonpoint source problems in the watershed has been a long-term effort, initiated in 1990, with the support of 319(h) funds and other funding from, and support by, stakeholders. The 319(h) grant projects, special studies, and other activities that have been completed to date include:

- ***Irrigation Demonstration Project:*** In 1994, the Ventura County Resource Conservation District successfully completed an irrigation project that demonstrated the water quality and conservation benefits of drip irrigation. This project was funded through a 319(h) grant.
- ***Toxicity Testing:*** In order to detect sources of toxicity, we had collected water samples under three sequential studies (toxicity testing by UC Davis). Results of this sampling indicated sporadic toxicity, generally during wet weather seasons, with strong implication of organophosphate pesticides. A peer-reviewed paper on the results is pending.
- ***Calleguas Creek Watershed Treatment – Phases I and II:*** The Ventura County Resource Conservation District served as contractor for this project which focused on Best Management Practices that involved small, individual landowners/ farmers. This demonstration project was

designed to implement streambed protection practices. The two phases were funded through 319(h) grants.

Current Activities

The following is a summary of current regional board activities in the Calleguas Creek Watershed which are expected to continue as part of the Watershed Management Initiative.

CORE REGULATORY

Permits in this watershed were targeted for renewal in FY 2001-02. Current regulatory activities include compliance inspections, review of monitoring reports, response to complaints, and enforcement actions, as needed.

A watershed-wide regional monitoring program was created to fill in data gaps and eliminate duplicative and unnecessary monitoring. POTWs contributed significant resources to do a surface and ground water characterization study. It also serves to assess nonpoint source pollution from a variety of land uses.

Additionally, most urban areas in Ventura County, including this watershed, are implementing Best Management Practices (BMPs) under the Municipal Storm Water Permit (revised in 2000). The “Discharger” consists of the co-permittees Ventura County Flood Control District, the County of Ventura, and the Cities of Camarillo, Fillmore, Moorpark, Ojai, Oxnard, Port Hueneme, San Buenaventura, Santa Paula, Simi Valley, and Thousand Oaks. The Discharger is required to implement the Ventura Countywide Stormwater Quality Urban Impact Mitigation Plan (SQUIMP), which requires the implementation of BMPs to reduce the discharge of pollutants in storm water from new development and significant redevelopment. Other requirements of the Municipal Storm Water Permit include a public education program, an educational site inspection program for industrial and commercial facilities, program for construction sites, public agency activities, and a storm water monitoring program.

The Calleguas Creek receives municipal storm drain discharges from the City of Camarillo, City of Moorpark, City of Simi Valley, City of Thousand Oaks (part), and unincorporated Ventura County (part).

The storm water monitoring program has consisted of land-use based monitoring, receiving water and mass emission station monitoring, and bioassessment. The Discharger also participates in regional monitoring activities, such as the Storm Water Monitoring Coalition, organized by the Southern California Coastal Water Research Project. Furthermore, the Discharger participates in the development and implementation of volunteer monitoring programs in the Ventura Coastal watersheds.

In fulfillment of NPDES permit requirements for one discharger, and in concert with other point and nonpoint source dischargers, a characterization study of primarily point source loadings for the pollutants of concern began in June 1998.

Regulation of groundwater protection activities is intended to eventually become fully integrated into the watershed management approach; currently, groundwater monitoring (for POTWs using ponds) is being coordinated with surface water monitoring.

MONITORING AND ASSESSMENT

Calleguas Creek was a focus for SWAMP monitoring in FY00/01 as the watershed was targeted in the rotating watershed cycle. Since extensive monitoring has already occurred here, particularly in the lower watershed, a more directed approach to sampling site selection was taken.

As the first integrated watershed monitoring program in the Region, the six POTWs in the watershed are each implementing a portion of the monitoring program as described in their NPDES permits, and as further revised in their Characterization Study to also include other agencies in the effort. In conjunction with the receiving water monitoring, land-use based monitoring is done as a part of the Ventura County Municipal Storm Water Program. The monitoring supports compliance valuation, nonpoint source identification, and potential TMDL development. The expanded monitoring by the dischargers will also serve to evaluate beneficial uses.

Additionally, the Regional Board periodically conducts TSMP sampling in Mugu Lagoon, Calleguas Creek and Revolon Slough.

The BPTCP has identified the lagoon and tidal prism as "toxic hot spots" based on sediment contamination. Staff have completed a preliminary cleanup plan for the areas which was adopted as part of a statewide consolidated plan by the State Board in June 1999. Cleanup/remediation alternatives identified include dredging, in-situ capping, and treatment; however, dedicated funding for cleanup activities has not been provided by the state. Continuing Regional Board activities include working with stakeholders to further characterize historical sources of pollution as well as the extent of existing contributions. While remediation of the lagoon (as part of a military facility) may proceed on its own timeline, in general, there is a concerted effort by all stakeholders to prepare a comprehensive watershed management plan to address all problems in the watershed.

Six TMDLs are currently scheduled for this watershed over the next five years and considerable resources will be needed to support their development.

205(j) monies funded a component of the Surface Water Element of the Calleguas Creek Characterization Study Monitoring Program which is evaluating nonpoint source contributions in the watershed. The study seeks to identify nonpoint source loadings of nitrogen, salts, and pesticides and with the results of the Surface Water Element, conduct TMDLs on several of these pollutants. The study is currently in the data analysis stage.

The Calleguas Creek Watershed Management Plan Habitat/Recreation and Land Use Subcommittees are jointly working on aspects of a Watershed Evaluation Study that is scheduled to be finished in 2002. This is a GIS-based effort with the goals of identifying high quality habitat and those areas that would help link them, the current level of protection, land ownership, and information from local entities land use plans. Another goal is to make the information available via the Internet.

UCLA is under contract with the State Board to provide data needed for establishment of nutrient TMDLs in several watersheds within the Region including Calleguas Creek, Santa Clara River, and Malibu Creek. By understanding the inter-relationships between water quality and habitat condition and the resulting effects that these interactions have on the biological communities of coastal watersheds, this research will further our understanding of the ecology of southern

California watersheds. Besides providing information supporting the establishment of nutrient TMDLs for these three impaired coastal watersheds, the data collected may provide insight into how these TMDLs might be complied with in the future. Three specific objectives of this project are: 1) investigate the relationships between water quality (e.g. nutrients), habitat quality, and the biological community, 2) investigate how water quality and biological communities change throughout particular target reaches representing different land uses, and 3) compare the relationships between water quality, habitat quality, and biological communities among different watersheds. The work is a continuation and extension of a Regional Environmental Monitoring and Assessment Program (R-EMAP) project in the Calleguas Creek Watershed. R-EMAP is part of a larger national effort by the USEPA to assess the condition of the nation's ecological resources.

NONPOINT SOURCE PROGRAM

We expect that stakeholders will continue work on developing a watershed management plan, which will include measures for reducing pollutants from nonpoint sources. Accordingly, our efforts in the Calleguas Creek watershed will focus on continuing the nonpoint source phase of the watershed cycle, including integrating results of our on-going nonpoint source efforts. The 319(h) grant projects, special studies, and other activities that are currently on-going include:

319(h) Grants

Calleguas Creek Water Quality Monitoring Program: The Wishtoyo Foundation received 319(h) grant funds in 2001 to educate and train volunteers to conduct a citizen monitoring program in the watershed. The goal is to measure the effectiveness of BMPs created to manage the flow of nutrients, pesticides, and sediments. Bioassessments will also be conducted.

We continue to support as high priorities for FY2002/03 319(h) funding projects relating to comprehensive erosion control efforts, habitat enhancement/restoration, and reduction of a variety of pollutants.

Other NPS Activities

Our efforts to involve stakeholders also shall include exploration of funding options (especially for implementation of nonpoint source measures) and continuation of other outreach activities, such as speeches, meetings, and participation in environmental events.

In this watershed, particularly with regards to agriculture, voluntary nonpoint source management measures are taking place. Agriculture is being brought into the watershed process as an important stakeholder and have, under the various subcommittees, brought to the table a number of voluntary best management practices.

Currently under consideration are agreements with sister agencies in regulatory-based encouragement of Best Management Practices. Most notably is the use of a GIS layer for pesticides application available from the Department of Pesticide Regulation (DPR). Reduction of pesticides identified as contaminants of concern for a watershed might be addressed through a Management Agency Agreement (MAA) with the DPR, or through waiving adoption of waste discharge requirements on an individual basis using information gathered in databases provided by the Ventura County Agricultural Commission office.

BASIN PLANNING

The 2001 Triennial Review identified as the highest priority adoption of TMDLs as Basin Plan amendments. This activity is currently funded with an expected 0.5 PYs/TMDL utilized. Another priority basin planning issue is continued work to determine the scope of water quality impacts from agricultural runoff in the Region. The majority of agricultural activities occur in the Calleguas Creek Watershed, especially in the Oxnard Plain and in the nearby foothills. Development of solutions to any impacts is also a high priority and will be a major concern of the nonpoint source program and, by extension, the watershed committee and subcommittees which will be addressing this as well as other problems. An evaluation of salt-sensitive agricultural resources will be done as part of the chloride TMDL.

Chloride impairments in certain reaches of the river led to formation of a chloride committee to conduct a chloride TMDL by spring 2000. This stemmed from issues raised during development of a chloride policy for the region. Growers are concerned about increased chloride and effects on salt-sensitive crops, such as avocados. In December 2000, the Board passed a resolution to extend the interim chloride limitation (190 mg/l) for discharges to the creek until December 7, 2001. A chloride TMDL for the creek is tentatively scheduled to go before the Board in early 2002.

WETLANDS PROTECTION AND MANAGEMENT

The [Southern California Wetlands Recovery Project](#) considers the lower Conejo Creek acquisition a high priority project for funding. The Habitat Subcommittee of the Calleguas Creek Watershed Plan Committee has also approved the acquisition as a priority. Funding for the Grimes Canyon Stream Restoration Project was approved by the Coastal Conservancy in June 2001.

A wetlands restoration plan for the watershed has been prepared (with Coastal Conservancy and USEPA funding) by a local consultant through the Habitat Subcommittee. This document is available in the Internet at the [Calleguas Creek Watershed Management Plan](#) website. The next step in the process, completion of a Wetlands Restoration Feasibility Study, has just begun.

[The Santa Monica Mountains Conservancy](#) is a state agency created by the Legislature in 1979 charged with primary responsibility for acquiring property with statewide and regional significance, and making those properties accessible to the general public. The Conservancy manages parkland in the Santa Monica Mountains, Santa Susana Mountains, the Simi Hills, the Santa Clarita Woodlands, the Whittier-Puente Hills, the Sierra Pelona, the Los Angeles River Greenway, the Rio Hondo, the Verdugo Mountains, the San Gabriel Mountains, and the San Rafael Hills. The agency's goals are to: 1) implement the Santa Monica Mountains Comprehensive Plan, 2) implement the Rim of the Valley Trails Corridor Master Plan, 3) implement the Los Angeles County River Master Plan, 4) further cooperation with local governments in the region to secure open space and parkland, and 5) expand education, public access, and resource stewardship components in a manner that best serves the public, protects habitat, and provides recreational opportunities.

DOD SITE CLEANUP PROGRAM

The Regional Board is working with the Department of Toxic Substances Control (DTSC) to investigate soil and groundwater quality. Sites currently under assessment/remediation include

Mugu Lagoon, a former landfill, the Naval Exchange gas station, two Installation Restoration Program (IRP) sites, numerous underground storage tanks, and the former oxidation sewage ponds.

The Navy disposed of inert, contaminated and hazardous wastes to an unlined unpermitted landfill constructed by depositing and compacting wastes into Calleguas Creek. An erosion berm was installed as an interim remedial measure to prevent further erosion of the former landfill by storm water flowing through the creek during storm events. Long-term groundwater monitoring will be required for this site. Sediments and surface water at IRP Site 5 are contaminated with chrome. An initial emergency removal action (sediment excavation) failed to adequately remediate all impacted sediments and additional sediment remediation and surface water monitoring is ongoing.

Soil and groundwater at IRP Site 24 is contaminated with chlorinated solvents. Groundwater is being treated by implementation of a new biodegradation technology. It is not yet determined to what extent groundwater remediation or monitoring will be required to restore this site.

It is anticipated the Navy will implement a base-wide groundwater/surface water investigation to evaluate the overall groundwater and surface water quality, evaluate the interactions of surface water and groundwater, and determine the cumulative risk of multiple groundwater-surface water contamination sites on the overall water quality of the area and the risk to human health and the environment.

Prior to 1979, the Navy was allowed to discharge partially treated wastewater to surface water oxidation ponds that were constructed in the Calleguas Creek tidal prism. The ponds were unlined and allowed to percolate unevaporated water to the underlying groundwater, which is located about four feet below grade. The Regional Board rescinded the Navy's discharge permit in 1979 and required the Navy to pump all wastewater to the Oxnard POTW. However, periodic unpermitted discharges of wastewater continued to the ponds during planned repairs of the wastewater discharge line and wastewater overflow conditions, which occurred during heavy rains.

To prevent additional wastewater discharges to the ponds, the Regional Board issued a Cleanup and Abatement Order to the Navy in 1998 directing the Navy to cease all unpermitted discharges, construct a lined emergency wastewater retention basin, upgrade the wastewater discharge line, and remove the sludge that has accumulated in the ponds.

Current funding for the investigation and remediation of contaminated solids, surface water and groundwater at the base is through the DoD/CalEPA funding agreement; however, this funding is not satisfactory for the investigation or control of contaminants from upstream sources for the protection of Mugu Lagoon and continued funding cuts have had significant impacts on the level of oversight by Regional Board staff on these areas.

Near-term Activities

Specific resource needs are described in the Region-wide Section of this document.

NPDES Permits in the watershed will come up for renewal in FY 2003/04. In the meantime, core regulatory activities will focus on permit compliance, monitoring report review, and enforcement as needed. In addition, integration of stormwater and nonpoint source issues will continue. Members of the watershed team will be involved with periodic updates of the State of the

Watershed Report. Additionally, there will be on-going interaction with stakeholders and followup on goals established during the permit renewal phase. Pending results from the discharger pollutant characterization study, a decision on waste load and load allocations will be pursued.

A review of resources for core regulatory activities against cost factors has determined that our region is seriously underfunded for our baseline program. We will be seeking more funding for our core program activities.

We shall have made significant progress later in this watershed's first cycle, toward identifying and assessing problems (through the characterization study) and involving stakeholders. At that point we (and the stakeholders) may also enough information to get a headstart on establishing load allocations for certain pollutants of concern.

Additional monitoring and assessment tasks include continued involvement in updates to the baseline State of the Watershed Report, focusing on filling data gaps and evaluating cumulative impacts as monitoring data become available from dischargers, evaluating the results of the Characterization Study, Regional Board ambient monitoring, follow-up on pollutants identified through toxicity identification evaluations, implement TMDLs to actually begin to solve problems found through monitoring, and implementing the municipal storm water program.

Our efforts to involve stakeholders shall also include exploration of funding options (especially for implementation of nonpoint source measures) and continuation of other outreach activities, such as speeches, meetings, and participation in environmental events. We shall continue our involvement in the watershed group's efforts to develop and implement a watershed management plan.

Additionally, we need to outreach more with the agricultural community. We are also proposing increased efforts in oversight and management of ground water resources. However, staff involvement in voluntary resolution of nonpoint source problems (Tier I) requires more resources than a regulatory-based approach. Tier II (regulatory encouragement) activities over the long-term include tracking nonpoint source inputs by supplemental databases such as DPR and the Department of Food and Agriculture (DFA), as well as increased sampling of the receiving water for contaminants of concern and toxicity. Tier III (effluent limitations) activities over the long-term include sampling, inspecting, and permitting priority contributors of contaminants of concern in watersheds not fully implementing a stakeholder-driven watershed approach. Staff are currently working on an agricultural policy for the board.

We will maintain involvement with stakeholder activities and pursue funding options, especially those involving implementation of nonpoint source measures (coordinate Small Community Grant, State Revolving Fund, 205(j), and 319(h) activities) as well as other outreach activities such as speeches, meetings, and participation in environmental events. As resources permit, we will also work with stakeholders to implement provisions of the Coastal Zone Act Reauthorization Amendments.

Potential Mid- to Long-term Activities

In the long-term, activities will include continued participation in both internal and external watershed planning efforts and further implementation of watershed-specific solutions. Several Basin Planning issues will be addressed through the Characterization Study and watershed planning efforts. More resources are needed for these activities in 2000/01 and beyond.

Other mid- to long-term issues include:

- Beneficial uses: Studies to evaluate beneficial use issues.
- Site specific objectives: Review studies conducted by dischargers or other watershed interests.
- Land use planning: Integrate water supply and quality issues with local land use planning and management.
- Groundwater: Integrate inter-related ground and surface waters--optimizing protection for both.
- Flood control: Institute better coordination of multi-agency reviews of environmental impacts for flood control and development projects, including the consideration of regional mitigation programs. Optimize the use of environmentally-friendly flood control facilities.
- Implementation of watershed-wide biological monitoring is a long-term goal for all of our watersheds.

Review and comment on watershed issues in CEQA documents (for the highest priority projects) will also continue; however, this is currently an unfunded program.

Under the BPTCP, we estimated that about 20% of the Western Arm and 10% of the Eastern Arm of Mugu Lagoon contain contaminated sediments (about 725,000 cubic yards). We estimate that about 3 miles of Calleguas Creek contains 50,000 to 100,000 cubic yards of contaminated sediments. We want to work with local groups to develop remediation plans. Due to sensitive nature of Mugu Lagoon, we would suggest no action or in-situ treatment, rather than dredging, as remediation options. Treatment is expensive (probably would exceed \$100 per cubic yard). Dredging could be used to remediate Calleguas Creek, although finding a suitable disposal site could be difficult; it would cost \$1 to 5 million.